

Chapter 2.0 Description of the Proposed Action

2.1 Introduction

This chapter provides a description of the action area and statement of the proposed action followed by a summary of the proposed action. The Rogue River Basin Project Talent Division, Oregon Facilities and Operations report (Vinsonhaler 2002) provides a comprehensive description of Project operation and hydrologic conditions.

2.2 Description of the Action Area

Reclamation defines the “action area” as all areas to be affected directly or indirectly by the Federal action, in this case, Project O&M activities. Project facilities and features lie within either the Rogue River basin or Klamath River basin.

The action area affected by Project O&M includes reservoirs and stream reaches primarily used by the three Project irrigation districts to divert, store, and deliver water as well as diversion dams, and water conveyance canals.

2.3 Proposed Federal Action

The proposed action is for Reclamation, pursuant to contracts with MID, RRVID, and TID, to continue to divert, store, deliver water, and operate and maintain Federal Project facilities consistent with past operation and maintenance. Summary tables are provided for dams and reservoirs (Table 2-1), diversion dams and conveyance or feeder canals (Table 2-2), and main conveyance canals (Table 2-3).

2.4 Interrelated and Interdependent Actions

Interrelated and interdependent actions are components of the overall determination of effects on ESA listed species or critical habitat effected by the proposed action. Interrelated and interdependent activity definitions as used in this BA are taken from USFWS and NMFS, *Consultation Handbook* (1998). An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility

apart from the action under consultation. Interrelated or interdependent activities are measured against the proposed action.

The Hopkins Canal, Jackson Street Diversion Canal, Phoenix Canal and Jackson Street Diversion Dam and Feeder Canal are privately owned facilities and are considered interrelated and interdependent due to the co-mingling of water delivered under Federal and private water rights. While these facilities could operate without the proposed action, it would be difficult to partition the water for separate effects analyses.

Other private facilities within the Project are not considered interrelated or interdependent because these facilities (1) do not depend on the proposed action for their justification and (2) have independent utility from the proposed action.

2.5 Description of the Proposed Federal Action

The proposed action description contains (1) Upper South Fork Little Butte Creek and Bear Creek areas (includes Jenny Creek) and (2) Antelope Creek and Dry Creek areas. Each section contains a description of the facilities and general operation procedures, broken down by water collection and storage facilities, and conveyance facilities (Figure 2-1). A detailed explanation of the facilities and operation and maintenance is provided in Rogue River Basin Project Talent Division, Oregon Facilities and Operations report (Vinsonhaler 2002).

Table 2-1. Dams and Reservoirs

Facility	BA Status	Facility Ownership	Location	Original Construction or Reclamation Rehabilitation	Storage or Water Right	O&M Responsibility
Agate Dam and Reservoir	Proposed Action	Reclamation	Dry Creek (Rogue)	Reclamation constructed in 1966	RRVID	RRVID
Howard Prairie Dam and Lake	Proposed Action	Reclamation	Jenny Creek (Klamath)	Reclamation constructed in 1958	Reclamation	TID
Hyatt Dam and Reservoir	Proposed Action	Reclamation	Keene Creek (Klamath)	TID built in 1922, Reclamation rehabilitated in 1961	TID	TID
Keene Creek Dam and Reservoir	Proposed Action	Reclamation	Keene Creek (Klamath)	Reclamation constructed in 1959	Reclamation & TID	TID
Green Springs Powerplant	Proposed Action	Reclamation	Emigrant Creek (Rogue)	Reclamation constructed in 1960	Reclamation & TID	Reclamation
Emigrant Dam and Lake	Proposed Action	Reclamation	Emigrant Creek (Rogue)	TID built in 1924, Reclamation rebuilt in 1961	Reclamation & TID	TID

Table 2-2. Diversion Dams and Collection or Feeder Canals

Facility	BA Status	Facility Ownership	Location	Original Construction or Reclamation Rehabilitation	Water Right	O&M Responsibility
Upper South Fork Little Butte Creek Diversion Dam and Collection Canal	Proposed Action	Reclamation	South Fork Little Butte Creek (Rogue)	Reclamation constructed in 1960	Reclamation	TID
Pole Bridge Creek Diversion Dam	Proposed Action	Reclamation	Pole Bridge Creek (Rogue)	Reclamation constructed in 1960	TID assigned to Reclamation	TID
Daley Creek Diversion Dam and Collection Canal	Proposed Action	Reclamation	Daley Creek (Rogue)	Reclamation constructed in 1960	TID assigned to Reclamation	TID
Beaver Dam Creek Diversion Dam	Proposed Action	Reclamation	Beaver Dam Creek (Rogue)	Reclamation constructed in 1960	TID assigned to Reclamation	TID
Conde Creek Diversion Dam and Collection Canal	Proposed Action	Reclamation	Conde Creek (Rogue)	Reclamation constructed in 1958	TID assigned to Reclamation	TID

Facility	BA Status	Facility Ownership	Location	Original Construction or Reclamation Rehabilitation	Water Right	O&M Responsibility
Dead Indian Creek Diversion Dam	Proposed Action	Reclamation	Dead Indian Creek (Rogue)	Reclamation constructed in 1958	TID assigned to Reclamation	TID
Soda Creek Diversion Dam and Feeder Canal	Proposed Action	Reclamation	Soda Creek (Klamath)	Reclamation constructed in 1959	TID	TID
Little Beaver Creek Diversion Dam and Delivery Canal	Proposed Action	Reclamation	Little Beaver Creek (Klamath)	Reclamation constructed in 1959	TID	TID
Antelope Creek Diversion Dam and Feeder Canal	Proposed Action	Reclamation	Antelope Creek (Rogue)	Reclamation constructed in 1966, fish screen & passage added in 1998	RRVID	RRVID
Agate Reservoir Feeder Canal	Proposed Action	Reclamation	Dry Creek (Rogue)	Reclamation constructed in 1966	RRVID	RRVID
Ashland Canal Diversion Dam	Proposed Action	Reclamation	Emigrant Creek (Rogue)	Reclamation relocated original works and rebuilt in 1959	TID and Reclamation	TID
Oak Street Diversion Dam	Proposed Action	Reclamation	Bear Creek (Rogue)	Reclamation constructed in 1961, fish screen & passage added in 1997	TID and Reclamation	TID

Facility	BA Status	Facility Ownership	Location	Original Construction or Reclamation Rehabilitation	Water Right	O&M Responsibility
Phoenix Canal Diversion Dam and Feeder Canal	Proposed Action	Reclamation	Bear Creek (Rogue)	originally built about 1900, Reclamation rehabilitated in 1960, fish screens & passage added in 1998	MID	MID
Jackson Street Diversion Dam and Feeder Canal	Interrelated and Interdependent	RRVID	Bear Creek (Rogue)	originally built about 1910, removed and replaced in an upstream location in 1998, fishscreen & passage added in 1999	RRVID	RRVID

Table 2-3. Main Conveyance Canals

Facility	BA Status	Facility Ownership	Location	Original Construction or Reclamation Rehabilitation	O&M Responsibility
Deadwood Tunnel	Proposed Action	Reclamation	South Fork Little Butte Creek (Rogue)	Reclamation constructed 1956-1958	TID
Howard Prairie Delivery Canal	Proposed Action	Reclamation	Jenny Creek watershed (Klamath)	Reclamation constructed 1956-1959	TID
Cascade Divide Tunnel	Proposed Action	Reclamation	(Cascade Divide)	Reclamation constructed 1958-1959	TID
Green Springs Tunnel	Proposed Action	Reclamation	(Rogue)	Reclamation constructed 1957-1959	TID
Ashland Canal	Proposed Action	Reclamation	Emigrant Creek (Rogue)	constructed in 1923	TID
East Canal	Proposed Action	Reclamation	Emigrant Creek (Rogue)	constructed in 1925	TID
West Canal	Proposed Action	Reclamation	Bear Creek (Rogue)	constructed in 1925	TID
Talent Canal	Proposed Action	Reclamation	Bear Creek (Rogue)	constructed prior to 1925	TID
Phoenix Canal	Interrelated & Interdependent	MID	Bear Creek (Rogue)	constructed in 1960	MID
Jackson Street Diversion Canal	Interrelated & Interdependent	RRVID	Bear Creek (Rogue)	constructed in 1906	RRVID
Hopkins Canal	Interrelated & Interdependent	RRVID	(Rogue)	constructed prior to 1910	RRVID

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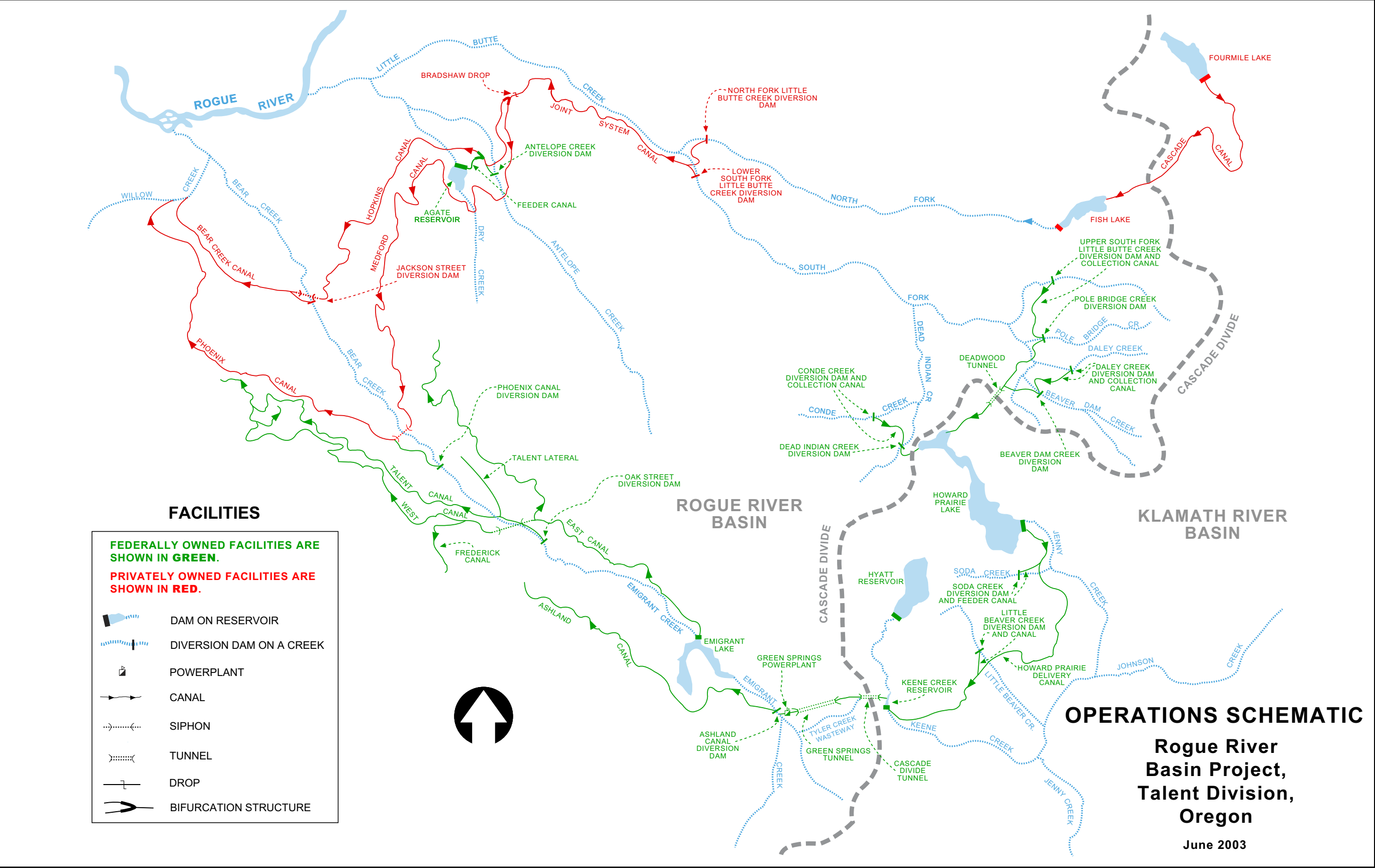


Figure 2-1

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2.5.1 Upper South Fork Little Butte Creek Area and Bear Creek Area

The Upper South Fork Little Butte Creek Area and Bear Creek Area include the following facilities:

Water Collection and Storage Facilities

- Water collection facilities on the headwaters of South Fork Little Butte Creek and its tributaries in the Rogue River basin which collect and move water from the Rogue River basin for storage in Klamath River basin.
- Water collection facilities on Jenny Creek tributaries in Klamath River basin
- Water storage facilities on Jenny Creek tributaries in Klamath River basin.
- Water storage facilities on Emigrant Creek in Rogue River basin.

Water Conveyance Facilities

- Water conveyance facilities which move water from the Rogue River basin to the Klamath River basin.
- Water conveyance facilities which move water from the Klamath River basin to the Rogue River basin.
- Diversion dams on Bear Creek which divert water into canals.

Powerplant Facilities

- Green Springs Powerplant

Water Collection and Storage Facilities

Vinsonhaler 2002, pages 3-5 through 3-7 shows collection and storage facilities of the Project, including private components.

Water Collection Facilities

A portion of the South Fork Little Butte Creek streamflows in Rogue River basin are diverted near its headwaters by the upper South Fork Diversion Dam into South Fork Collection Canal. From here, the canal extends about 4 miles where flows from Pole Bridge Creek are intercepted. At about mile 7.4, South Fork Collection Canal is joined by Daley Creek Collection Canal which collects runoff from Daley Creek and

Beaver Dam Creek. At mile 8.6, the 130 cfs capacity South Fork Collection Canal enters Deadwood Tunnel which conveys the collected runoff from the west to east side of Cascade Divide. This water is then discharged into the natural channel of Grizzly Creek and flows into Howard Prairie Reservoir in Klamath River basin.

Water from two other headwater tributaries of South Fork Little Butte Creek is also moved from Rogue River basin to Klamath River basin. The flow of Conde Creek is diverted at Conde Creek Diversion Dam into the Conde Creek Canal which terminates at Dead Indian Creek. The combined flow is then diverted into the 86 cfs capacity Dead Indian Creek Canal which crosses Cascade Divide and discharges into Howard Prairie Reservoir in the Klamath River basin.

These water collection facilities are operated and maintained by TID. The facilities can operate year round but most creek diversions usually occur during winter and spring months prior to the needs of downstream senior natural flow rights in Little Butte Creek drainage.

The average amount of water transferred for water years 1962 to 1999 was about 15,500 acre-feet (Table 2-4). Table 2-4 provides an estimate of the volume and timing of average monthly diversions of South Fork Little Butte Creek transbasin transfers.

Table 2-4. Average Monthly South Fork Little Butte Creek¹ Transbasin Water Transfer, Rogue River Basin Project (acre-feet)

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
259	618	1,510	1,603	1,636	2,285	3,020	3,127	1,059	277	54	49

¹ Average of the sum of measured flow for water years 1962 to 1999. South Fork Little Butte Creek Collection Canal near Pinehurst (USGS:1433940) and Dead Indian Canal near Pinehurst (USGS:14340400).

Water Storage Facilities

The storage facilities in the South Fork Little Butte Creek Area and Bear Creek Area include: Howard Prairie Dam and Reservoir (Lake), Hyatt Dam and Reservoir, and Keene Creek Dam and Reservoir on Jenny Creek drainage in Klamath River basin, Emigrant Dam and Reservoir (Lake) on Bear Creek drainage in Rogue River basin. Contracts between Reclamation and TID, MID, and RRVID provide for these reservoirs to be operated as a pooled system with a total active capacity of 115,000 acre-feet. These contracts allocate the pooled storage as follows:

- 8,500 acre-feet (7.3913 percent) is preferred capacity assigned to TID. The first annual inflow to the system is assigned to this preferred capacity.
- The residual capacity of 106,500 acre-feet (92.6987 percent) is considered as new capacity and is assigned as follows:
 - 4,000 acre-feet (3.7559 percent) to RRVID
 - 8,000 acre-feet (7.5117 percent) to MID
 - 94,500 acre-feet (81.3411 percent) to TID

Each irrigation district has the right to carry its stored water over from one year to the next year as long as the stored water does not exceed its assigned reservoir space. TID operates and maintains the water storage facilities.

Howard Prairie Dam and Lake

Howard Prairie Dam and Lake (total capacity 62,100 acre-feet; active capacity 60,600 acre-feet), located on Jenny Creek in Klamath River basin, receives water from South Fork Little Butte Creek transbasin transfers and also captures natural runoff from Jenny Creek watershed. The filling of Howard Prairie Lake can occur at any time and at any rate. There is not any formalized flood control operation for the lake. The priority for filling Howard Prairie Lake is to use runoff from Jenny Creek watershed and supplement it by the transbasin transfers from South Fork Little Butte Creek Collection System.

Howard Prairie Dam and Lake provide water for irrigation purposes in the Bear Creek drainage of Rogue River basin and for hydroelectric generation at Green Springs Powerplant. Releases from Howard Prairie can be made at any time into the 18.7-mile-long Howard Prairie Delivery Canal which terminates at Keene Creek Reservoir. Storage releases are usually maintained at the maximum 53 to 55 cfs carrying capacity of Howard Prairie Delivery Canal throughout the year except as modified by downstream runoff intercepted by the canal enroute to Keene Creek Reservoir. Enroute flows from Soda and Little Beaver Creeks are diverted into Howard Prairie Delivery Canal.

Hyatt Dam and Reservoir

Hyatt Dam and Reservoir (total capacity 16,200 acre-feet; active capacity 16,200 acre-feet) located in Klamath River basin stores runoff from Keene Creek watershed, a tributary of Jenny Creek. Hyatt Reservoir is operated by TID to supplement

irrigation and hydroelectric generation water demands not met from Howard Prairie Lake. Hyatt Reservoir releases flow down Keene Creek a few miles to Keene Creek Reservoir.

Hyatt Reservoir can be filled at any time and at any rate. Although no formalized flood control operations exist, prudent efforts are made to maintain some flood control capability. The goal at Hyatt Reservoir is to operate in the top half (8,000 acre-feet) of the reservoir. This allows 8,000 acre-feet of stored water to be carried over to the next year and provides some reasonable assurance Hyatt Reservoir will refill.

Keene Creek Dam and Reservoir

Keene Creek Dam and Reservoir (total capacity 370 acre-feet; active capacity 260 acre-feet) receives water from Howard Prairie Lake by means of Howard Prairie Delivery Canal and from Hyatt Reservoir which is released into Keene Creek. The dam creates an impoundment to regulate flows to Green Springs Powerplant for various generating modes.

Emigrant Dam and Reservoir (Lake)

Emigrant Dam and Lake (total capacity 40,500 acre-feet; active capacity 39,000 acre-feet) sits on Emigrant Creek in Rogue River basin. Emigrant Lake is the lowermost storage facility in this system and gets its water supply from several sources:

- Water transferred by South Fork Little Butte Creek Collection System from Rogue River basin to Klamath River basin and then released from Howard Prairie Lake
- Runoff from Keene Creek (Jenny Creek tributary in Klamath River basin) impounded in and then released from Hyatt Reservoir
- Runoff from various Jenny Creek tributaries in Klamath River basin which is intercepted by Howard Prairie Delivery Canal enroute to Keene Creek Reservoir
- Emigrant Creek natural inflow

Emigrant Dam and Reservoir are operated by TID to provide irrigation water supply in Bear Creek drainage and for flood control. Releases are made into Emigrant Creek or directly into TID's East Canal.

Water can be impounded in the flood control reserved space only when inflow from Emigrant Creek is greater than 600 cfs or flow in Bear Creek at Medford Gage (USGS: 14357500) is forecasted to be greater than 3,000 cfs. Any flood control reserved space filled under the foregoing conditions must be evacuated as soon as possible.

The lake reaches its highest level after April 1. It is drawn down during the irrigation season and reaches its lowest level in mid-October. The outlet gates at Emigrant Dam are normally completely shut at the end of the irrigation season to accommodate refill of the lake. At the end of the irrigation season releases from Emigrant Lake are made only if required by the flood control management plan. Tributaries, and for a time irrigation return flows, provide most of the flow in the mainstem unless flood control releases are made. No ramping protocols are required during changes in releases from Emigrant Lake for flood control purposes.

Project irrigation demands can often be met during the spring months with natural flow from tributaries downstream from Emigrant Dam and irrigation surface and subsurface return flows. When irrigation demands can no longer be fully met from these sources, storage water is released from Emigrant Lake to meet demands of the three irrigation districts. Stored water is called for by MID and RRVID from TID, who operate Emigrant Dam and Reservoir. The released stored water is assessed against the respective irrigation district's stored water supply.

Emigrant Creek flows about 4.5 miles downstream from Emigrant Dam to the confluence of Neil Creek (RM 24.8) where Bear Creek begins. From this point Bear Creek continues an additional 24.8 miles to its confluence with the Rogue River.

Water Conveyance Facilities

The water conveyance facilities which move water from Klamath River basin through the Cascade Divide to Rogue River basin consist of Howard Prairie Delivery Canal, Keene Creek Reservoir, and Green Springs Powerplant and appurtenant works.¹ These facilities transfer water (1) which had been collected from the headwaters of South Fork Little Butte drainage and moved from the west to east side of Cascade Divide for storage in Howard Prairie Lake and (2) Jenny Creek tributary runoff

¹ The Green Springs Powerplant complex consists of the power conduit (the power conduit includes a 2,150-foot-long Cascade Divide Tunnel, a 4,500-foot-long concrete pressure pipe, and a 5,050-foot-long Green Springs Tunnel) and a 9,000-foot-long penstock

impounded by Howard Prairie and Hyatt Dams as well as downstream runoff intercepted en route to Rogue River basin.

Howard Prairie Delivery Canal

The 18.7-mile Howard Prairie Delivery Canal extends from the outlet of Howard Prairie Dam to Keene Creek Reservoir on Keene Creek. This canal is operated by TID up to its maximum carrying capacity (53 to 55 cfs) to meet irrigation needs for stored water in Emigrant Lake and to facilitate hydroelectric generation at Green Springs Powerplant.

The extent of releases from Howard Prairie Lake depends upon flows of Soda Creek and Little Beaver Creek which are intercepted en route by Howard Prairie Delivery Canal. Soda and Little Beaver Creek flows and Howard Prairie Lake storage are monitored through the hydromet system. When Howard Prairie Delivery Canal is close to capacity due to Soda Creek and Little Beaver Creek inflows, releases from Howard Prairie Lake are curtailed. Peak inflow from Soda Creek is about 11 cfs and from Little Beaver Creek about 24 cfs.

During water years 1961 to 2000, an annual average amount of about 24,000 acre-feet of runoff from the Jenny Creek drainage was moved from the east to west side of the Cascade Divide through Green Springs Powerplant and appurtenant works. Table 2-5 provides an estimate of the volume and timing of average monthly diversions of this Jenny Creek contribution.

**Table 2-5. Average Monthly Jenny Creek¹ Transbasin Water Transfer
Rogue River Basin Project (acre-feet)**

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
238	330	1,014	1,598	3,579	6,171	6,988	2,629	724	358	227	220

¹ Based on observed and estimated flow and reservoir content for water years 1961-2000 at Howard Prairie Lake, Hyatt Reservoir, Green Springs Powerplant, (USGS:14339499, South Fork Little Butte Creek Collection Canal Near Pinehurst), and Dead Indian Collection Canal near Pinehurst (USGS:14340400). See the Draft Technical Memorandum, Jenny Creek Contributions to the Rogue basin, March 1, 2001, in appendix B, Vinsonhaler 2002.

Green Springs Powerplant and Appurtenant Works

Water released from Keene Creek Reservoir flows through Green Springs Powerplant and appurtenant works and is discharged into Emigrant Creek upstream of Emigrant

Lake. The 18 megawatt powerplant and appurtenant works are operated by Reclamation. Power and energy is provided to Bonneville Power Administration at the switchyard.

Green Springs Powerplant operates daily during the irrigation season. During the nonirrigation season, Green Springs Powerplant normally operates on an abbreviated schedule. If Keene Creek Reservoir receives higher than normal flows, then Green Springs Powerplant is operated accordingly. When water bypasses the powerplant, it travels through a wasteway to Schoolhouse Creek, Tyler Creek, and Emigrant Creek.

When total storage in Howard Prairie Lake is less than 20,000 acre-feet, the operation for higher power generation is modified. This is done by reducing the continuous flow into Keene Creek Reservoir to 30 cfs or the amount of available unregulated runoff, whichever is greater.

The average annual transbasin transfer through Green Springs Powerplant and appurtenant works for water years 1962 to 1999 amounts to 39,500 acre-feet. This is comprised of 15,500 acre-feet moved from Rogue River basin by South Fork Little Butte Creek Collection Canal to Howard Prairie Lake (Table 2-4) plus 24,000 acre-feet of Jenny Creek drainage runoff (Table 2-5).

The major water diversion dams and conveyance facilities which carry water within the Rogue River basin and convey the water to points of use include:

- Ashland Canal Diversion Dam, on Emigrant Creek at RM 33.7 about 100 feet downstream from Green Springs Powerplant discharge, diverts up to 48 cfs into Ashland Canal on the west side of the creek.
- The 132 cfs capacity East Canal receives water directly from Emigrant Dam at RM 29.3 and the 39 cfs capacity West Canal bifurcates off East Canal at mile 11.0.
- Oak Street Diversion Dam at RM 21.59 diverts up to 65 cfs into the Talent Canal which begins on the east side of Bear Creek.
- Phoenix Canal Diversion Dam at RM 16.8 delivers water into the Phoenix Canal with a maximum of 102 cfs on the west side of Bear Creek. The Phoenix Canal also receives up to 49 cfs from Little Butte Creek drainage by siphon from the Medford Canal. The maximum capacity of the Phoenix Canal at the junction is 75-85 cfs.

- Jackson Street Diversion Dam at RM 9.5 diverts into a short canal on the west side that connects with the 50 cfs capacity Hopkins Canal before it crosses Bear Creek by siphon. The Hopkins Canal also carries water from Little Butte Creek drainage.

Table 2-6 shows annual diversions in Bear Creek drainage by the three irrigation districts for water years 1990 through 1999. The average annual diversion during the irrigation season by the three districts for these ten years was 70,000 acre-feet.

Table 2-6. Annual MID, TID, and RRVID Diversions in Bear Creek Subbasin for Water Years 1990-1999 (acre-feet)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Upstream from Emigrant Reservoir										
Ashland Canal	10,300	7,600	6,300	6,200	8,300	6,100	8,100	9,400	7,100	6,900
Directly from Emigrant Reservoir										
East Canal	36,700	29,500	26,200	28,700	32,700	29,300 ¹	34,600	33,100	38,700	39,700
Downstream from Emigrant Reservoir Diverted From Bear Creek										
Talent Canal	8,300 ²	13,800	8,800	12,500	11,200	14,000	13,500	14,000	13,500	15,500
Phoenix Canal	13,000	14,900	4,800 ³	11,200	7,000	11,700	10,100	9,800	10,600 ³	14,500
Hopkins Canal	4,100	4,200	5,200	6,700	8,600	7,900	8,200	8,900	7,900	6,800
Total	72,600	70,000	50,900	65,500	67,800	69,000	74,500	76,700	72,200	80,900
¹ Partial data for June 1995 and significant missing data for July 1995 but data estimated.										
² Missing data for May and June 1990.										
³ Partial data for June and July 1992 and missing data for May 1998.										
Source: Vinsonhaler 2002										

2.5.2 Antelope Creek/Dry Creek Areas

The Antelope Creek/ Dry Creek Areas includes the following facilities:

Water Collection and Storage Facilities

- Water collection facility on Antelope Creek

- Storage regulating facility on Dry Creek

Water Conveyance Facilities

- Antelope Feeder Canal
- Agate Feeder Canal

Water Collection and Storage Facilities

Vinsonhaler 2002, table 3-1, pages 3-5 through 3-7 shows collection and storage facilities of the Rogue River Basin Project.

Water Collection Facility

Antelope Creek Diversion Dam on Antelope Creek at RM 7.0, diverts up to 50 cfs into a connector canal extending about 0.1-mile to Hopkins Canal. Flow from Antelope Creek conveyed to Hopkins Canal are mingled with any flow in the canal and then water can be diverted at a bifurcation structure to Agate Reservoir. An estimated 1,400 acre-feet is diverted annually from Antelope Creek.

A minimum flow of 1 cfs must pass downstream from Antelope Creek Diversion Dam for streamflow maintenance from November-March. From April-October, 2 cfs or the natural streamflow, whichever is the lesser, must be bypassed for streamflow maintenance and senior water rights

Water Storage Facility

Agate Dam and Reservoir, located on Dry Creek in the Rogue River basin, stores and re-regulates water from Antelope Creek, natural flows of Dry Creek, and water conveyed from North and South Forks of Little Butte Creek. Agate Dam and Reservoir (total capacity 4,780 acre-feet; active capacity 4,670 acre-feet). The dam and reservoir are operated by RRVID as a storage-reregulating facility.

Water can be stored in Agate Reservoir at any time and at any rate consistent with downstream rights. There is no flood control operation as the reservoir is kept as full as possible. Water released from Agate Dam into Dry Creek flows a short distance downstream and then is diverted into Hopkins Canal for irrigation uses on RRVID lands on both the east and west side of Bear Creek. Dry Creek flows into Antelope Creek downstream then into Little Butte Creek at RM 3.2, downstream from Eagle Point.

Releases from Agate Reservoir of 1 cfs for streamflow maintenance in Dry Creek are made when inflow is equal to or greater than that amount. If inflow is less than 1 cfs, then that is released for streamflow maintenance. These releases are made through a 6-inch bypass line in the outlet works.

2.6 Maintenance

With the exception of Green Springs Powerplant, the irrigation districts have the responsibility for the maintenance of all Project facilities.

2.6.1 Inspection

All project facilities are subject to ongoing inspection programs. Dams identified as high significant risk to downstream population in the event of a failure, are examined every three years and an underwater inspection of the outlet works and spillway stilling basins by divers is typically conducted every six years. Diversion and delivery facilities, and dams characterized as low hazard are examined at least every six years.

Green Springs Powerplant penstock intake is periodically examined by divers. Flow through the penstock must be stopped to conduct this examination.

2.6.2 Routine Maintenance

The irrigation districts maintain the transferred works of the Project. Routine maintenance is preformed in accordance with state and Federal laws. To the extent possible, most maintenance is completed during the nonirrigation season. At times it may be necessary to work within the stream channel but an effort is made to minimize this work. Any extraordinary maintenance will be consulted on separately.

Fish screens and passage facilities are maintained according to the various Designer's Operating Criteria documents. Fish screens are removed every year and the headgates closed as a precaution against damage from high runoff.

The maintenance program may include, but is not limited to the following activities:

- repair eroded concrete
- recoat or replace corroded metal work

- repair cavitation damage to control gates
- remove sediment, rock and debris from intake and outlet works
- stabilize embankments
- reshape canals
- replace rip rap
- remove trees and debris
- repair structures at creek crossings
- maintain access roads and right of way fencing
- noxious and aquatic weed control

2.6.3 Green Springs Powerplant

Reclamation maintains the reserved works of Green Springs powerplant and its appurtenant facilities including Tyler Creek bypass channel. Routine maintenance is done in accordance with state and Federal laws. Maintenance items include but are not limited to:

- turbine and transformer upkeep
- tailrace upkeep
- stabilize embankments

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